

REMARKS:

Claim 11 has been amended to overcome the rejection under 35 U.S.C. 112. Claim 17 covers the resin weight of cancelled claim 16. Claims 27 and 28 cover the resin thickness and end count described on page 8, paragraph 1; and, page 6, paragraph 3 of the specification.

Claims 1 and 26 have been revised to overcome all of the cited and non-cited references by using the term, "consisting of:" to replace the term, "comprising", thereby distinguishing from these references.

A. This distinction will limit the claim coverage to the term, "untwisted"; the term "twisted" is mandatory for use in both the Nels and the Winckler references; Ohya, et al only discloses using twisted (i.e., spirally wound) fibers. Watts not only discloses using "twisted" fibers, in his examples, but also uses numerous polymers, none of which include cyanate esters.

B. This distinction will also limit the claim coverage to "continuous" filaments rather than "discontinuous" filaments of Ohya, et al, Winckler and Nels, described infra.

C. Nels discloses the use of a surface bonding, however, this surface bonding is made at the expense of requiring the use of twisted fibers, which results in fracture points, discussed infra.

A copy of the amendment claim status and clean copy of the claims on file are enclosed.

THE REFERENCES:U.S. PATENT 5,670,231 TO OHYA, ET AL:

Ohya, et al describes a method of forming the coupling by means of "cutting the yarn into less than several centimeters" (Col. 6, lines 11 - 14). Obviously, this method means the use of discontinuous (i.e., chopped fibers), rather than Applicants' "continuous" fibers.

Additionally, Ohya, et al describes "spiral weaving" (Col. 6, lines 9 - 11; and, Col. 7, lines 21 - 23), rather than Applicants' use of "untwisted" yarn. A copy of pages 98, 99 from the book, TEXTILE third edition by Norma Hollen and Jane Saddler (1969) published by The Macmillan Company, Library of Congress catalog card number 68-10814 is enclosed. On page 98, "Classification by Twist" "Twist is defined as the **spiral** arrangement of the fibers around the axis of the yarn. On page 99, "AMOUNT OF TWIST" is defined in the Example column as 6 - 8 t.p.i. for filling yarns, equivalent to Nels (Col. 5), infra.

U.S. PATENT 5,842,551 TO NELS:

The Nels patent mandates and requires the use of "twisted" fibers (Col. 5, lines 50 - 67), rather than Applicants' "untwisted" yarn. But, Nels' fiber twisting results in fracturing of the fiber (Col. 6, lines 1 - 6). In other words, Nels teaches away from Applicants' untwisted product. Thus, the description of Ohya, et al of 1. discontinuous fibers (i.e., chopped yarn); and, 2. "spiral weaving", (i.e., yarn twisting) together with Nels' "twisted" fibers, describe a product distinct from Applicants' claimed yarn which is both untwisted and continuous, and also works better.

Moreover, a comparison between FIG. 5 of Nels and FIG. 2C of Winckler clearly shows that both Nels and Winckler are using stress broken fiber, rather than Applicants' continuous fiber.

U.S. PATENT 4,997,067 TO WATTS:

Watts' examples ONE and TWO uses yarn at 6.0 twists/inch. Since Ohya, et al describes using twisted (spiral) yarn, the combination of Nels, Winckler, Watts and Ohya, et al teach the same in terms of requiring "twisted yarn rather than Applicants' "untwisted" yarn.

Watts states (Col. 7, lines 20 - 24) that the coupling may be woven or non-woven, and this will be discussed, infra, in terms of the numerous research variables available for a research program.

Also, Watts' possible use of untwisted fibers should be taken in context with his possible use of non-woven (e.g., matt) couplings. In this connection, enclosed is a copy of pages 116 - 118 from the text TEXTILES, third edition (1969) by Norma Hollen and Jane Saddler, published by The Macmillan Company; Library of Congress catalog card 68-10814. Page 118 shows a non-woven fiber (matt) which is unoriented, and hence the fibers would not require a twisted orientation. The fibers also are broken (photograph on page 118 of TEXTILES), not continuous as claimed by Applicants - cf. photos of Nels and Winckler.

Nels who filed in 1997, six years after Watts issued in 1991, makes a necessary, specific requirement to use "twisted" yarn (Col. 5, lines 50 - 67) for couplings, as does Watts' examples ONE and TWO.

Watts also discloses numerous polymers for a reinforcing or an impregnating material, such as TEFLON^R, phenolics, polyesters, polyimides, and polyether ether ketones (PEEK), but not cyanate esters.

U.S. PATENT 5,862,993 TO WINCKLER:

Winckler teaches the use of twisted, discrete fibers, and the figures and descriptions are clearly distinguished from Applicants' claimed coupling providing fibers which are untwisted and continuous.

Moreover, the combination of Winckler and Ohya, et al requires:
1. fiber twisting; 2. discrete (i.e., stress-broken) fibers rather than Applicants' continuous fibers; again, the photographs of Winckler and Nels (supra) show stress-broken fibers; and, 3. Winckler's use of phenolics, instead of cyanate esters (Ohya, et al).

IN SUMMARY:

To arrive at Applicants' invention, the combination of references would require: 1. Nels to provide an untwisted yarn, not the twisted product; 2. Ohya, et al to provide an untwisted, not a spirally wound fiber; 3. Watts would be required to use a cyanate ester, rather than the five disclosed polymers; and, 4. Winckler would have to undo his requirements for twisted, and discrete fibers - Applicants use neither of Winckler's two components, and in fact the reverse is true. In terms of Applicants' claimed coverage and restriction of the claims to "consisting of:", rather than "comprising", the combination of cited references results in a maze of ambiguous and/or contradictory requirements.

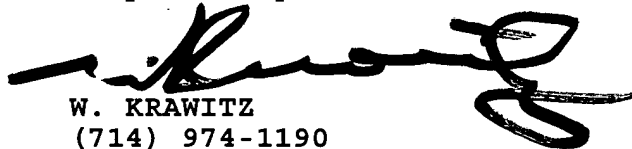
For example, Ohya, et al (spirally wound fibers) and Watts (untwisted fibers) are internally inconsistent in terms of teaching fiber twisting. Nels, unlike Watts requires fiber twisting, which requires "at least 9.0 twists/inch" (Col. 5, lines 50 - 67). Moreover, FIG. 5 of Nels is the same as FIG. 2B of Winckler who describes and requires discontinuous fibers.

Finally, in terms of being "obvious to try", it will be noted that there are four (4) parameters associated with an "obvious to try" undertaking for an experimental program; but, this would require a considerable expenditure of money and time. These parameters are: 1. use of a cyanate ester resin versus other types of disclosed resins available e.g., Winkler's phenolics; and, Watts' TEFLON^R, polyimides, PEEK (polyether ether ketone), and polyester; 2. use of continuous fibers versus discontinuous fibers; 3. use of untwisted yarn versus twisted yarn; and, 4. use of non woven fabric (Watts, Col. 7, lines 20 - 24) versus woven fabric.

These four parameter variables result in a total of eleven (11) combinations: hence, (11) x 5 (phenolics, TEFLON^R, polyimides, PEEK, and polyester) x 2 (continuous versus discontinuous fibers) x 2 (untwisted versus twisted) x 2 (woven versus non-woven) = at least 440 combinations.

A research program involving 440 possibilities would entail a considerable amount of time and expense to produce Applicants' claimed combination listed above. But, none of the inventors including the respective assignees of Winckler and Ohya, et al were able to cherry pick these parameters to arrive at Applicants' invention. Even General Motors, the assignee of Winckler simply does not have the necessary budget for an "obvious to try" research program suggested by the Patent Examiner. Neither does Mitsubishi, the assignee of Ohya, et al.

Respectfully submitted,


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DATED

This will certify that this amendment, claim status and clean copy of the claims were placed in an envelope addressed to MAIL STOP NON-FEE AMENDMENT, COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VIRGINIA 22313-1450, with sufficient postage as EXPRESS MAIL #EV 286 976 303 US, and deposited with the U.S. Postal Service on February 9, 2004.

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DATED


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